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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/912,545      | 07/26/2001  | Bertrand Penther     | 211814US2           | 4607             |

22850 7590 11/30/2004

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EXAMINER

WARE, CICELY Q

ART UNIT PAPER NUMBER

2634

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |                   |  |
|------------------------------|-----------------|-------------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s)      |  |
|                              | 09/912,545      | PENTHER, BERTRAND |  |
|                              | Examiner        | Art Unit          |  |
|                              | Cicely Ware     | 2634              |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,13,16,18 and 19 is/are rejected.
- 7) ☒ Claim(s) 3,7-12,14,15 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 08/11/2000. It is noted, however, that applicant has not filed a certified copy of the foreign application as required by 35 U.S.C. 119(b).

### ***Drawings***

2. It is office policy to request from applicants that submitted figures contain both text and numerical labels to allow individuals viewing each figure to be able to determine the designation of each element in the figure without having to go into the specifications.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

4. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a

Art Unit: 2634

nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

6. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

7. Claims 20-21 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative and/or, cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 20-21 have not been further treated on the merits.

8. Claim 2 is objected to because of the following informalities:

a. Claim 2, line 3, applicant uses the phrase "when said the value". Examiner suggests using "when the value" for clarification purposes.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 2, 4, 5, 13, 16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huynh et al. (US Patent 6,028,901) in view of Applicant Admitted Prior Art.

(1) With regard to claim 1, Huynh et al. discloses in (Fig. 1B) a method for equalizing symbols received from a transmission channel and for decoding data therefrom, characterized in that a second processing comprising an equalizing step (21, 31) followed by a turbodecoding sequence, the selection (42, 41) of the first or the second processing being made upon an estimation of the delay spread of the transmission channel (abstract, col. 1, lines 4-12, 42-45, col. 2, lines 23-32, col. 5, lines 13-36).

However Huynh et al. does not disclose a first processing comprising a turboequalizing sequence on the received symbols.

However Applicant's Admitted Prior Art discloses in (Fig. 1) wherein a first processing comprising a turboequalizing sequence on the received symbols (Pg. 4, lines 7-8, 13-14)

Therefore it would have been obvious to one of ordinary skill in the art to modify Huynh et al. in view of Applicant's Admitted prior art to incorporate a first processing

comprising a turboequalizing sequence on the received symbols in order to provide significantly enhanced processing of signals under conditions where delay spread has distorted the signals.

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Huynh et al. further discloses in that the first processing is chosen when the value of the delay spread of the transmission channel is high and the second processing is chosen when the value of the delay spread is low (abstract, col. 2, lines 27-33).

(3) With regard to claim 4, claim 4 inherits all the limitations of claims 1, 2 or 3. Applicant's Admitted Prior Art further discloses in (Fig. 1) wherein the turboequalizing sequence includes the iteration of a soft equalizing step (140) according to an APP type algorithm, a deinterleaving step (150) and a soft decoding step (Pg. 4, lines 13-28).

(4) With regard to claim 5, claim 5 inherits all the limitations of claim 4. Applicant's Admitted Prior Art further discloses in that the APP type algorithm is a List-type APP algorithm (Pg. 7, lines 27-28).

(5) With regard to claim 13, claim 13 inherits all the limitations of claims 1, 2 or 3. Applicant's Admitted Prior Art further discloses in (Fig. 1) wherein the turboequalizing sequence includes the iteration of a soft equalizing step (140) including a filtering step for canceling the intersymbol interference over the transmission channel, the filter having L taps where L is a variable parameter given by the delay spread of the transmission channel, a deinterleaving step (150) and a soft decoding step (Pg. 1, lines 5-13, 15, Pg. 2, lines 1-2, Pg. 4, lines 7-8, 14-15, 24-29).

(6) With regard to claim 16, claim 16 inherits all the limitations of claim 1.

Applicant's Admitted Prior Art further discloses in (Fig. 1 (100, 110) a method for coding data, characterized in that it performs either a first processing comprising a coding step followed by an interleaving step of a second processing including a turbocoding step for turbocoding said data (Pg. 4, lines 3-6, 9-11).

(7) With regard to claim 18, claim 18 inherits all the limitations of any of claims 1-15. Applicant's Admitted Prior Art further discloses in (Fig. 1) a receiver comprising means for carrying out the method in any of claims 1-15 (Pg. 4, lines 13-28).

(8) With regard to claim 19, claim 19 inherits all the limitations of claims 16 or 17. Applicant's Admitted Prior Art further discloses in (Fig. 1) a transmitter for carrying out the method claimed in claim 16 or 17 (Pg. 4, lines 7-9).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huynh et al. (US Patent 6,028,901) in combination with Applicant's Admitted Prior Art, as applied to claims 4 or 5 above, and further in view of Bienz (US Patent 5,414,738).

With regard to claim 6, claim 6 inherits all the limitations of claims 4 or 5. Huynh et al. in combination with Applicant Admitted Prior Art disclose all the limitations of claims 4 or 5. However Huynh et al. in combination with Applicant's Admitted Prior Art do not disclose the method characterized in that the number of states of the APP trellis is equal to  $M^{J-1}$  where  $M$  is the modulation alphabet size used over the transmission channel and  $J$  is a strictly positive integer which is chosen according to a characteristic of the transmission channel.



However Bienz discloses the method characterized in that the number of states of the APP trellis is equal to  $M^{J-1}$  where M is the modulation alphabet size used over the transmission channel and J is a strictly positive integer, which is chosen according to a characteristic of the transmission channel (col. 3, lines 30-43, col. 5, lines 10-18).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Huynh et al. in combination with Applicant's Admitted Prior Art to incorporate the method characterized in that the number of states of the APP trellis is equal to  $M^{J-1}$  where M is the modulation alphabet size used over the transmission channel and J is a strictly positive integer, which is chosen according to a characteristic of the transmission channel in order to obtain reliability information for symbol (Bienz, col. 5, lines 13-14).

#### ***Allowable Subject Matter***

12. Claims 3, 7-12, 14, 15 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method for equalizing symbols received from a transmission channel and for decoding data therefrom. Prior art references (Huynh et. al., 6,028,901) show similar methods but fail to teach: **“characterised in that the first processing is selected when the value of said delay spread rises above a first threshold and the second processing is selected when the value of the delay spread falls under a**

**second threshold”, as in claim 3; “characterised in that J is chosen higher than the value of said delay spread if the transmission channel is affected by fast fading”, as in claim 7; “characterised in that J is chosen lower than the value of said delay spread if the propagation involves a Line of Sight component”, as in claim 8; “characterised in that J is chosen according to the power profile of the channel impulse response”, as in claim 9; “characterised in that said soft decoding step is based upon an APP type algorithm involving  $2^{\sup K-1}$  states, K being increased when J decreases and K being decreased when J increases”, as in claim 10; “characterised in that K is determined as the highest integer for which  $a \cdot 2^{\sup K-1} + b \cdot M^{\sup J-1}$ , where a and b are fixed coefficients, is lower than a predetermined resource value”, as in claim 11; “characterised in that at least one of K and N, the number of iterations of the turbo-equalizing sequence is adapted so that  $N(a \cdot 2^{\sup K-1} + b \cdot M^{\sup J-1})$ , where a and b are fixed coefficients is lower than a predetermined resource value”, as in claim 12.**

### ***Conclusion***

13. The prior art made record and not relied upon is considered pertinent to applicant's disclosure:

- a. Bottomley et al. US Patent 6,335,954 discloses a method and apparatus for joint synchronization of multiple receive channels.
- b. Crozier et al. US Patent 6,510,536 discloses reduced-complexity max-log-app decoders and related turbo decoders.

Art Unit: 2634

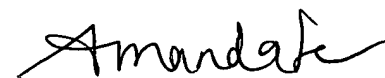
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw  
November 23, 2004



AMANDA T. LE  
PRIMARY EXAMINER